REMARKS

Responsive to the outstanding Office Action, applicant has carefully studied the Examiner's rejections. The abstract has been deleted and a new abstract presented. Claim 13 has been amended herein. Favorable reconsideration of the application in light of the following detailed arguments is respectfully requested.

OBJECTIONS TO THE SPECIFICATION

The abstract of the disclosure was objected to for being of undue length. In response thereto, the abstract has been deleted herein and a new abstract has been included which is less than 150 words. In view of the above, withdrawal of this objection is respectfully requested.

CLAIM OBJECTIONS

Claims 26 and 27 were objected to for being drawn to processes but depending from independent apparatus claim 13. Claim 26 has been amended herein to depend from method claim 25. Claim 27 has been amended to include structural elements in the method claim, and is no longer dependent. It has instead been presented as an independent method claim. In view of the above, reconsideration and withdrawal of these claim objections is requested.

REJECTION OF CLAIMS UNDER 35 USC §112

Claims 13-24 were rejected under 35 USC 112, second paragraph for being indefinite. Specifically, the Examiner noted that claim 13 did not indicate what device was included in the claim scope.

Claim 13 has been amended herein in a manner which is believed to clearly indicate that the liquid distributor is the claimed scope of the invention. Additional structure is referred to in the preamble, but is not defined in the "comprising" portion of the claim.

In view of the above, reconsideration and withdrawal of this rejection are respectfully requested.

REJECTION OF CLAIMS UNDER 35 USC §103

In the outstanding Office Action, the Examiner made the following rejections:

Claims 13-15, 17-19 and 21-23 were rejected under 35 USC §103 as being unpatentable over US 470,060 (Lille) in view of US 3,849,232 (Kessler) and US 5,054,547 (Shipley).

Claims 16 and 24 were rejected under 35 USC 103 as being unpatentable over Lille in view of Kessler and Shipley and further in view of US 5,217,065 (Green).

Claims 13 and 20 were rejected under 35 USC 103 as being unpatentable over Lillie in view of Kessler, Van Hesselt (WO 02/070120) and Shipley.

Claims 25-27 were rejected under 35 USC 103 as being unpatentable over US 5,004,043 (Mucic) in view of US 4,133485 (Bouvin), WO 03/053563 (Manteufel) and US 5,217,065 (Green).

With regard to the rejection of claim 13, as being unpatentable over Lille in view of Kessler and Shipley, the Examiner has stated that:

> Kessler et al discloses a liquid distributor for two liquid phases to be distributed uniformly into a plurality of tubes of an upright tube-bundle reactor for carrying out chemical reactions (see page 1, lines 20-29 and figure 1), wherein the tubes (b) are retained at the top and bottom by tube sheets (p', p) and closed against the outside of the tube (see figure 1 and page 1. lines 46-69 and line 79 through page 2, line 23), and wherein a distribution chamber (D) is arranged above the upper tube sheet (p'), wherein a distribution (G) chamber is arranged above the upper tube sheet (p'); wherein a first liquid distribution system is arranged above the tube sheet (p') or on it, which system is connected to at least one outer feed device (v'); and a second liquid distribution system is arranged above the first liquid distribution system, which system is connected to at least one other outer feed device (v') and contains one upper and one lower distribution tray (0', p2), wherein the lower distribution tray (p2) contains a plurality of openings (g) which are arranged flush above the first liquid distribution system, and exhibits at least one device for setting a uniform liquid level above the openings, wherein the upper distribution tray (0') is connected to the feed device (v') for liquid, and contains a plurality of overflow weirs or plate holes from which the liquid is able to discharge into the lower distribution tray (p2), and wherein each of the overflow weirs is

assigned to a plurality of openings in the lower distribution tray (see page 1, line 35 through page 2, line 23 and figure 1).

The present invention, as defined in independent claim 13, defines a liquid distributor for two liquid phases to be distributed uniformly into a plurality of tubes of an upright tube-bundle reactor for carrying out chemical reactions, wherein the tubes are retained at the top and bottom by tubesheets and closed against the outside of the tube, and wherein a distribution chamber is arranged above the upper tubesheet, which chamber contains feed pipes for two different liquids and at least one gas phase. The distributor comprises a first liquid distribution system is arranged above a tubesheet or on it, which first system is connected to at least one outer feed device, and contains a weir, installed outside the tubed area, with openings at the bottom and a plurality of inlet sleeves. One inlet sleeve is assigned at the top to each of the tubes in a tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and said sleeves have at least one lateral and one further opening located above the tubesheet and are open at the bottom facing each assigned tube in the tube bundle. A second liquid distribution system is arranged above the first liquid distribution system, which system is connected to at least one other outer feed device and contains one upper and one lower distribution tray. The lower distribution tray contains a plurality of openings which are arranged flush above the inlet sleeves of the first liquid distribution system, and exhibits at least one device for setting a uniform liquid level above the openings. The upper distribution tray is connected to the feed device for liquid, and contains a plurality of overflow weirs or plate holes from which the liquid is able to discharge into the lower distribution tray, and wherein each of the overflow weirs is assigned to a plurality of openings in the lower distribution tray.

Applicants respectfully disagree with the Examiner's contentions regarding the Kessler document. The Kessler distributor, as defined in that patent, is not capable of distributing a feed with two (immiscible) liquid phases uniformly into a plurality of tubes of an upright-tube bundle for carrying out chemical reactions. In Kessler, the trough (6) would separate the two immiscible liquids, thus preventing the feeding of a stoichiometric mixture to the individual reactor tubes, as is required in claim 13. Similarly in the Lillie reference, the plate p^z would cause this same effect and would

similarly prevent the feeding of a stoichiometric mixture to the individual reactor tubes. Therefore, as this same defect is found in both of the references, there is no combination of these references which would yield the invention as claimed in claim 13.

The Shipley reference was cited by the Examiner to show:

> a first liquid distribution system which contains a weir, installed outside the tubed area, with openings at the bottom and a plurality of inlet sleeves (26), wherein one inlet sleeve is assigned at the top to each of the tubes (24) in the tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and the said sleeves have at least one lateral and one further opening (36) located above the tube sheet (16) and are open at the bottom facing each assigned tube in the tube bundle (see column 3, line 41 through column 4, line 64 and figures 1-6).

There is nothing in this reference to overcome the deficiency in the Kessler and Lillie references as noted above.

Further, it should be noted that the distributors disclosed by Kessler would face distribution problems with higher gas loads which could bend the small descending liquid stream to the individual tubes. This problem of the prior art is avoided in the present invention by the claimed inlet sleeve (1) which conveys the liquid from the perforated fine distributor (15) to the individual tube (10). It is respectfully submitted that no combination of the applied reference show this feature of the claimed invention.

In view of the above, it is respectfully submitted that no combination of the applied references disclose the invention as claimed in claim 13. Reconsideration and withdrawal of this rejection is respectfully requested.

With regard to the rejection of Claims 16 and 24 as being unpatentable over Lille in view of Kessler and Shipley and further in view of Green, claims 16 and 24 are dependent upon an allowable base claim, as shown above, and are believe to be allowable based, at least, upon that dependence.

With regard to the rejection of claims 13 and 20 as being unpatentable over Lillie in view of Kessler, Van Hesselt (WO 02/070120) and Shipley, the Examiner included the Van Hasselt reference to disclose the overflow weirs of the upper distribution tray of

the second liquid distribution system exhibiting a serrated shape on its upper edge or lower edge.

It is respectfully submitted that nothing in the Van Hasselt reference changes the analysis of the present invention as discussed above. Therefore, for the reasons stated above, it is requested that this rejection also be reconsidered and withdrawn.

It is additionally noted that dependent claim 17 discloses the upper liquid distribution system rests on the inlet sleeves of the lower liquid distribution system. It is respectfully submitted that this feature is not disclosed in any of the applied references, and therefore that this claim further defines over the art of record.

With regard to the rejection of claims 25-27 as being unpatentable over US 5,004,043 (Mucic) in view of US 4,133485 (Bouvin), WO 03/053563 (Manteufel) and US 5,217,065 (Green), it is first noted that claim 27 has been amended to include the structural elements found in claim 13 and has been rewritten in independent form. It is respectfully submitted that no combination of the applied references shows these structural limitations, and that this claim is therefore allowable over the applied art of record.

With regard to claims 25 and 26, claim 25 defines a method for two liquid phases to be uniformly distributed into a plurality of tubes of an upright tube-bundle reactor, the liquids being two liquids which cannot be mixed and which, because of their non-miscibility, cannot be pre-mixed, wherein the liquids are introduced separately into the individual tubes of the tube bundle.

The present invention allows two (immiscible) liquid phases uniformly into a plurality of tubes of an upright-tube bundle for carrying out chemical reactions. The claimed invention provides for the feeding of a stoichiometric mixture to the individual reactor tubes. There is no combination of these references which would yield the invention as claimed in claim 25.

As noted above, the prior art distributors would face distribution problems with higher gas loads which could bend the small descending liquid stream to the individual tubes. The configuration of the present invention by the inlet sleeve (1) which conveys

the liquid from the perforated fine distributor (15) to the individual tube (10) avoids this problem. It is respectfully submitted that no combination of the applied reference show this feature of the claimed invention.

In light of the above, it is respectfully submitted that independent claims 13, 25 and 27 are allowable over the applied art of record. The dependent claims are allowable based, at least, on their dependence from allowable base claims. Action towards that end is respectfully requested.

SUMMARY

It is believe that the above amendments place the application in condition for allowance. Should the Examiner wish to modify the application in any way, applicant's attorney suggests a telephone interview in order to expedite the prosecution of the application.

Respectfully submitted,

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